

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: Ashok N. Rudrapatna  
Naresh Sharma

Serial No.: 09/967,009

Filed: September 28, 2001

For: Harq Techniques For Multiple Antenna  
Systems

Group Art Unit: 2133

Examiner: Stephen M. Baker

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Customer No. 46290

**REVISED APPEAL BRIEF**

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicants hereby submit this Revised Appeal Brief to the Board of Patent Appeals and Interferences in response to the Notice of Non-Compliant dated June 11, 2007. A one-month date for response is July 11, 2007. Since this Revised Appeal Brief is timely filed on or before July 11, 2007 it is timely filed. The fee for filing this Appeal Brief is \$500 was previously paid, however, should additional fees be required the Commissioner is authorized to deduct said fees from Williams, Morgan & Amerson, P.C. Deposit Account No. 50-0786/2100.011200.

**I. REAL PARTY IN INTEREST**

The present application is owned by Lucent Technologies, Inc.

## **II. RELATED APPEALS AND INTERFERENCES**

Applicants' representative(s), and the Assignee are not aware of any appeals, interferences, or judicial proceedings that are related to, may be affected by, might affect or have a bearing on the Board's decision in this appeal.

## **III. STATUS OF THE CLAIMS**

Claims 1 and 3-21 are pending in the instant application. All the pending claims are the subject of the present appeal and they are attached as Appendix A. Claims 1, 3, 4 and 7-9 stand rejected in the Final Office Action issued on August 9, 2006 under 35 U.S.C. §102(e) as allegedly being anticipated by Kenney (U.S. Patent No. 6,771,705). Claims 10-21 have been allowed by the Examiner.

## **IV. STATUS OF AMENDMENTS**

Applicants believe that there were no amendments filed subsequent to the Final Office Action.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

Embodiments of the present invention provide methods of implementing a re-transmission technique for multiple antenna systems where multiple streams of information may be transmitted simultaneously. By employing a multiple antenna system, at least two streams of bits may be transmitted. Two or more bit streams may be error coded, for example, per-stream coded. Each encoded stream may be transmitted and/or received by at least one antenna of a multiple antenna system.

Independent claim 1 is generally directed to a method for processing a block of information.

The method of claim 1 comprises forming at least two error control coded streams, using a separate error code encoder for each stream, from the block of information. For example, in one embodiment, blocks of data generated by an information source are initially demultiplexed into a predetermined number,  $p$ , of bit streams of information. Then each bit stream of the  $p$  bit streams has a cyclic redundancy check added thereto, and is then channel encoded, modulated and formatted according to the HARQ technique used. One representative protocol involves forming Chase packets from each bit stream, while another protocol involves forming IR sub-packets from each bit stream. See Patent Application, II. 5-28 on page 4 and in Figure 4.

The method of claim 1 also comprises transmitting the error control coded streams in response to a confirmation message, wherein a first error control coded stream is independently transmitted by a first antenna of a multiple antenna system and a second error control coded stream is independently transmitted by a second antenna of the multiple antenna system. For example, each of the formed  $p$  number of error coded streams (e.g., Chase packet(s) and/or IR sub-packet(s)) is thereafter transmitted by the transmitting equipment using a multiple antenna system. Each error coded stream may be independently transmitted by one or more antennas of the multiple antenna system, depending on the scheme employed. See Patent Application, II. 5-28 on page 4 and in Figure 4.

Independent claim 10 is generally directed to a method for processing received error control coded streams that are formed separately using respective separate error control code encoders. For example, in one embodiment, a number,  $p$ , of error coded streams are received by receiving equipment using a multiple antenna system. See Patent Application, Figure 2 and lines 3-39 on page 5. Prior to transmission and reception, each bit stream of the  $p$  bit streams has a cyclic redundancy check added thereto, and is then channel encoded, modulated and formatted

according to the HARQ technique used. One representative protocol involves forming Chase packets from each bit stream, while another protocol involves forming IR sub-packets from each bit stream. See Patent Application, Il. 5-28 on page 4 and in Figure 4.

The method of claim 10 comprises performing independent error detection of at least two of the received error control coded streams in a multiple antenna system, wherein at least one confirmation message is transmitted in response to the performed independent error detection. For example, each received error coded stream is MIMO decoded, for example, and then demodulated according to the modulation scheme of the transmitting equipment. Thereafter, an error correction step is independently performed on each of the p number of decoded, demodulated and MIMO decoded error coded streams. Each of the p number of MIMO decoded, demodulated, error decoded bit streams is first independently detected for errors. Here, an independent error detection step, such as cyclic redundancy checking, is performed on each of these error coded streams. In response to performing this independent cyclic redundancy checking, a confirmation message is sent for each error coded stream. If one or more error coded streams pass their independent cyclic redundancy checking step, an ACK message is sent by the receiving equipment for that error coded stream(s). In contrast, a NACK message is sent by the receiving equipment for each error coded streams failing its independent cyclic redundancy checking step. See Patent Application, Figure 2 and lines 3-39 on page 5.

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Appellants respectfully request that the Board review and overturn the single rejection present in this case. The following issue is presented on appeal in this case:

A) Whether claims 1, 3-4, and 7-9 are anticipated by Kenney under 35 U. S. C. §102(e).

## VII. ARGUMENT

Appellants respectfully submit that the Examiner erred in rejecting claims 1, 3, 4 and 7-9. Appellants respectfully request that the rejection of claims 1, 3, 4 and 7-9 over Kenney be reversed.

### A. Claims 1, 3, 4 and 7-9 are not anticipated by Kenney

As the Board well knows, an anticipating reference by definition must disclose every limitation of the rejected claim in the same relationship to one another as set forth in the claim. M.P.E.P. §2131. Under this legal principle, it is respectfully submitted that all pending claims are in condition for allowance.

In the Office Action mailed August 9, 2006, claims 1, 3, 4 and 7-9 were finally rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Kenney (U S Patent 6,771,705 to Kenney et al.). Applicants respectfully disagree and submit that the Examiners' position is flawed for multiple reasons, as set forth below.

Independent claim 1, among other things, is generally directed to a method for of processing a block of information. The method comprises forming at least two error control coded streams, using a separate error code encoder for each stream, from the block of information, the formed at least two error control coded streams being transmitted in response to a confirmation message, wherein a first error control coded stream is independently transmitted by a first antenna of a multiple antenna system and a second error control coded stream is independently transmitted by a second antenna of the multiple antenna system. As set forth in

M.P.E.P. §2131, a claim is anticipated under 35 U.S.C. §102(e) only if **each and every element as set forth** is found, either expressly or inherently described, in a single prior art reference.

Kenney describes forming two data streams for transmission by separate antennae 113, 114. However, the streams transmitted by the antennae 113, 114 both include data encoded by the two encoders 201, 204. For example, antenna 113 receives a data stream that includes parity data subset 1 formed by encoder 1 and parity data subset 3, which is formed by encoder 2. See Kenney, col. 4, line 56 – col. 5, line 39 and Figure 2. Thus, Kenney does not teach or suggest forming at least two error control coded streams, using a separate error code encoder for each stream, as set forth in independent claim 1. Kenney also fails to teach or suggest that the first error control coded stream is independently transmitted by a first antenna and the second error control coded stream is independently transmitted by a second antenna, as set forth in independent claim 1. To the contrary, Kenney teaches that each antenna transmits a data stream that is formed by combining data encoded by multiple encoders.

For at least the aforementioned reasons, Appellants respectfully submit that **Kenney** fails to anticipate independent claim 1 and dependent claims 3-4 and 7-9. Appellants respectfully request that the Examiner's rejections of claims 1, 3-8, and 10-22 under 35 U.S.C. §102(e) be REVERSED.

## **VIII. CLAIMS APPENDIX**

The claims that are the subject of the present appeal- claims 1, 3, 4 and 7-9 are set forth in the attached "Claims Appendix."

## **IX. EVIDENCE APPENDIX**

There is no separate Evidence Appendix for this appeal.

## **X. RELATING PROCEEDINGS APPENDIX**

There is no Related Proceedings Appendix for this appeal.

## **XI. CONCLUSION**

In view of the foregoing, Applicants respectfully submit that the Examiner's assertions that the inventions defined in claims 1, 3, 4 and 7-9 are anticipated by Kenney are misplaced. It is respectfully submitted that the Examiner erred in not allowing all claims pending in the present application over the prior art of record. That is, Appellant respectfully submits that Kenney does not disclose the entirety of the instant invention set forth in claims 1, 3, 4 and 7-9. Accordingly, Appellant respectfully requests that the Board review and overturn the §102 rejections present in this case.

For at least the aforementioned reasons, Appellants respectfully request the Board reverse the Examiner's rejections of all the pending claims. The undersigned agent may be contacted at (713) 934-4052 with respect to any questions, comments or suggestions relating to this appeal.

Please date stamp and return the enclosed postcard to evidence receipt of this document.

Respectfully submitted,

/Mark W. Sincell/

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## **CLAIMS APPENDIX**

1. (Previously Presented) A method of processing a block of information, the method comprising:

forming at least two error control coded streams, using a separate error code encoder for each stream, from the block of information, the formed at least two error control coded streams being transmitted in response to a confirmation message, wherein a first error control coded stream of the at least two error control coded streams is independently transmitted by a first antenna of a multiple antenna system and a second error control coded stream of the at least two error control coded streams is independently transmitted by a second antenna of the multiple antenna system.

2. (Canceled)

3. (Previously Presented) The method of Claim 1, wherein the at least two error control coded streams comprise at least one of a Chase packet and/or at least one of an Incremental Redundancy subpacket.

4. (Previously Presented) The method of Claim 3, wherein the confirmation message comprises an acknowledgement message or a non-acknowledgement message.

5. (Original) The method of Claim 4, further comprising:

re-transmitting the Chase packet in response to the non-acknowledgement message.

6. (Original) The method of Claim 5, wherein the step of retransmitting the Chase packet is repeated until at least one of the acknowledgement message is received, a time out occurs, and one less than a maximum number of symbol periods is reached.

7. (Original) The method of Claim 4, further comprising:  
transmitting at least another Incremental Redundancy sub-packet in response to the non-acknowledgement message.

8. (Original) The method of Claim 7, wherein the step of transmitting at least another Incremental Redundancy sub-packet is repeated until at least one of the acknowledgement message is received, a time-out occurs, and one less than a maximum number of symbol periods is reached.

9. (Previously Presented) The method of Claim 1, wherein the at least two error control coded streams are employed in at least one of a one-to-many communication system and a many-to-many communication system.

10. (Previously Presented) A method of processing received error control coded streams that are formed separately using respective separate error control code encoders, the method comprising:

performing independent error detection of at least two of the received error control coded streams in a multiple antenna system, wherein at least one confirmation message is transmitted in response to the performed independent error detection.

11. (Previously Presented) The method of Claim 10, further comprising:  
forming a block of information from the independent error detected at least two received error control coded streams.

12. (Previously Presented) The method of Claim 11, wherein each of the at least two received error control coded signals are independently received by a single antenna of the multiple antenna system.

13. (Previously Presented) The method of Claim 11, wherein the step of performing independent error detection comprises cyclic redundancy checking the at least two error control coded streams.

14. (Previously Presented) The method of Claim 13, wherein the at least two error control coded streams comprise at least one of a Chase packet and/or at least one of an Incremental Redundancy subpacket.

15. (Previously Presented) The method of Claim 14, wherein the at least one confirmation message comprises at least one of an acknowledgement message and a non-acknowledgement message, and the acknowledgement message is transmitted if at least one of a combined Chase packet or at least one of a combined Incremental Redundancy subpacket of the at least two received error control coded streams passes the step of cyclic redundancy checking.

16. (Previously Presented) The method of Claim 15, further comprising:

transmitting at least another confirmation message in response to performing cyclic redundancy checking on at least one combined packet including the at least one Chase packet and/or performing cyclic redundancy checking on at least one combined packet including another at least one Incremental Redundancy sub-packet from the at least two received error control coded streams.

17. (Previously Presented) The method of Claim 14, wherein the at least one confirmation message comprises at least one of an acknowledgement message and a non-acknowledgement message, the non-acknowledgement message is transmitted if at least one of a combined Chase packet or at least one of a combined Incremental Redundancy sub-packet of the at least two received error control coded streams fails the step of cyclic redundancy checking.

18. (Previously Presented) The method of Claim 17, further comprising:

performing an Incremental Redundancy function on at least one of the at least two received error control coded streams for packet combining, wherein the Incremental Redundancy function enables cyclic redundancy check to indicate the failure of the Incremental Redundancy sub-packet.

19. (Previously Presented) The method of Claim 18, further comprising:

transmitting at least another confirmation message in response to performing cyclic redundancy checking on at least one combined packet including the at least one Chase packet and/or performing cyclic redundancy checking on at least one combined packet including

another at least one Incremental Redundancy sub-packet from the at least two received error control coded streams.

20. (Previously Presented) The method of Claim 19, further comprising:  
performing a Chase function on at least one of the at least two received error control coded streams for packet combining, wherein the Chase function enables cyclic redundancy check to indicate the failure of the Chase packet.

21. (Previously Presented) The method of Claim 19, further comprising:  
transmitting at least another confirmation message in response to performing cyclic redundancy checking on at least one combined packet including at least one Chase packet and/or performing cyclic redundancy checking on at least one combined packet including another at least one Incremental Redundancy sub-packet from the at least two received error control coded streams.